

# Water Available for Replenishment Report, Draft Outline (DWR December 2015)

California Water Code Section 10729(c): The department shall prepare and publish a report by December 31, 2016, on its Internet Web site that presents the department's best estimate, based on available information, of water available for replenishment of groundwater in the state.

## 1. Introduction and Purpose

*This chapter will begin with a history of conjunctive management in California, including a description of the roles of groundwater and surface water and other water available methods. Next, this chapter will give an introduction to the Sustainable Groundwater Management Program and the role of "water available for replenishment of groundwater" in sustainability planning. All topics (including hydrologic variability, climate change, etc.) will be presented consistent with how they will be handled in GSP regulations currently being developed by DWR.*

## 2. How to Use This Report

*This chapter will describe how to use the information included in the report, both quantitative and qualitative. This section will describe a suggested groundwater sustainability planning process that GSAs and water resources planners can use to identify, screen, select, and implement feasible strategies and alternatives for estimating water available for replenishment at the basin level. A flowchart of the suggested groundwater sustainability planning process will be included to help guide planning, from regional considerations and solutions to project-specific selection and implementation. This chapter will also describe uncertainty in report information and results, and distinguish specifically between the regional estimates and the project-specific examples. This chapter will conclude with a description of the remainder of the report that will include a description of water available for replenishment (Chapter 3), planning information and estimates of water available by hydrologic region (Chapter 4), and a discussion of water available associated with the State Water Project and Central Valley Project (Chapter 5). The report will also include roadmaps and project-specific examples of water available analysis by potential source type (Chapter 6), as well as roadmaps and project-specific examples of potential methods for replenishment of groundwater, showing how the replenishment method affects the analysis and results (Chapter 7). Finally, the report will include a next steps section (Chapter 8) that will describe how GSAs can apply the analytical techniques described in the project-specific examples section and the process for moving projects from planning concept to implementation.*

## 3. Descriptions of "Water Available for Replenishment"

- Water available for replenishment in two parts.
- Potential water available methods.
- Types of replenishment in the form of increased "managed recharge," as defined and discussed in Update 2013. Generally, replenishment can be accomplished by active recharge or in-lieu methods.
- Variability by hydrology, demand, conveyance, climate change, etc.

*This chapter will provide a statewide generalized overview of water available for replenishment, including an introduction to the potential water available methods that could be used to support groundwater sustainability. Potential water available methods considered will include all existing water available methods that are not fully being utilized, including but not limited to surface water, recycled water, conserved water, brackish or saline water, and transferred water — all in the context of increasing the amount of “managed recharge” for both direct and in-lieu components. This chapter will also describe how SGMA will compel water managers and GSAs to consider replenishment of groundwater as a water resources management objective in local, regional, tribal, State, and federal project investigations. This chapter will provide guidance in the form of recommended approaches for GSAs to assess and incorporate hydrologic variability and climate change vulnerability (including scenario planning) into their GSP development and implementation (as they may be supplemented by information in the following Chapter 4). Finally, the chapter will also describe factors contributing to uncertainty.*

#### **4. Water Available: Information and Estimates, by Hydrologic Region**

- Information Associated with Water Availability.
  - Water Supplies, reported by planning area.
  - Water Use, reported by planning area.
  - Service Areas.
  - Storage.
  - Conveyance.
  - Water Rights.
  - Hydrology.
  - Tools.
  - Uncertainties.
    - Institutional and Regulatory Constraints.
    - Climate Change.
  - Challenges, including data gaps by hydrologic region with recommendations for GSAs and DWR to close those gaps.
- Regional Estimate of Water Available, reported by planning area.
  - Surface Water.
  - Conservation.
  - Recycling.
  - Desalination.
  - Water Transfers.
- Regional Considerations for Replenishment of Water Available.
  - Aquifer storage available for recharge.
  - Regional potential of aquifer recharge (includes a map of potential groundwater recharge areas).
  - Description of aquifers that could employ in-lieu strategies to replenish groundwater.
    - Storage volume associated with the intersection of potential recharge areas, in-lieu areas, and existing aquifer storage space.

*This chapter will provide a standard presentation of information that can support water available estimates, as well as an estimate of water available for replenishment for each of the state’s 10 hydrologic regions. Much of this information may come from continuing work in support of updates to the*

*California Water Plan, including the most recent 2013 update. The information and estimates of water available will focus on opportunities and constraints associated with each of the potential water available methods. In general, the discussion and presentation will consider water available with the existing infrastructure and constraints, new infrastructure, and modified constraints. Qualitative and quantitative elements will be included as appropriate. Input and guidance with local and regional water managers — as well as coordination through their respective GSAs — will be essential in identifying and understanding current and potential future infrastructure and constraints.*

*This chapter will conclude with identification of realistic regional opportunities to develop additional water available for groundwater replenishment for each region. It will also address, in a general way, the uncertainties in operational constraints for future facilities, and show linkages between those constraints and the extent to which SGMA sustainability goals can be achieved. Finally, this chapter will consider uncertainties related to climate change and list specific challenges associated with potential implementation of projects.*

## **5. Water Available and State Water Project and Central Valley Project**

- Overview of water availability and the SWP and CVP.
- Water available associated with California WaterFix and new storage, including system reoperation.
- Central Valley water available information from SWP and CVP tools.

*This chapter will provide a description of water available associated with the SWP and CVP. The description will include project capability reporting as well as potential water available associated with projects that are being studied, including California WaterFix and future water storage. Finally, planning tools associated with the SWP and CVP also provide water available information at various locations in the Central Valley.*

## **6. Roadmaps and Project-specific Examples of Water Available by Methods**

- Surface Water.
- Conservation.
- Recycling.
- Desalination.
- Water Transfers.
- Other.

*This chapter will describe how GSA's should consider water available for replenishment in two parts. First, a source-of-water project should be selected from the list above and then a method-for-replenishment project will need to be selected. Examples of replenishment projects will be presented in Chapter 7. This chapter will describe and analyze project-specific examples of water available so that the reader will understand, in detail, how to determine water available for potential projects that a Groundwater Sustainability Agency may consider. Examples will be chosen to demonstrate how to analyze, in a step-by-step manner, water available for the specific of water available methods listed above. This chapter will also include a summary graphic that reflects the project planning and implementation principles illustrated with the project examples.*

## **7. Roadmaps and Project-specific Examples of Water Available for Replenishment Analysis, by Replenishment Method**

- In-lieu.
- Active Recharge.

*This chapter will describe and analyze project-specific examples of replenishment projects so that the reader will understand, in detail, how to determine water available for replenishment of groundwater. The project examples will demonstrate how a source of water can be used to replenish a groundwater basin by either active recharge or in-lieu management. Examples will be chosen to demonstrate how to analyze, in a step-by-step manner, how a source of water can support groundwater sustainability for a groundwater basin and a GSA. This chapter will also include a summary graphic that reflects the project planning and implementation principles illustrated with the project examples.*

## **8. Next Steps**

*This chapter will describe how GSAs can support their sustainability planning process with the information and guidance provided in this report. Next steps in sustainability planning will be suggested, including how to address data gaps, permitting and regulatory requirements, and uncertainties. The section will also highlight an array of potential planning decisions, including the identification, screening, and selection of water available methods for implementation and replenishment that GSAs may consider as they complete the sustainability planning process. Finally, this chapter will describe how to move to project-specific analysis and ultimately to project implementation.*